Oligopolies Part III

It's called an oligopoly. It's not a regular market. It's a market in which they control the prices and they've been doing it for years.

Richard Miller

The Prisoner's Dilemma

- Consider the prisoner's dilemma. Al and Ben, partners in crime, may have to strategize against each other after they have been apprehended. Each has a payoff matrix.
- Separated (so they can't communicate), each must decide whether to confess.

Payoff Matrices Illustrated: Al's

- Outcomes:
  - five years each if both confess
  - three years each if both consistently deny
  - one year for turning state's evidence and convicting the other for 10 years

		AL	
		confess	not confess
BEN	confess	5	10
	not confess	1	3

- Al's dominant strategy is to confess!

Payoff Matrices Illustrated: Ben's

- Outcomes:
  - five years each if both confess
  - three years each if both consistently deny
  - one year for turning state's evidence and convicting the other for 10 years

		AL	
		confess	not confess
BEN	confess	5	1
	not confess	10	3

- This is a mirror of Al's payoff matrix. Ben's dominant strategy is also to confess!

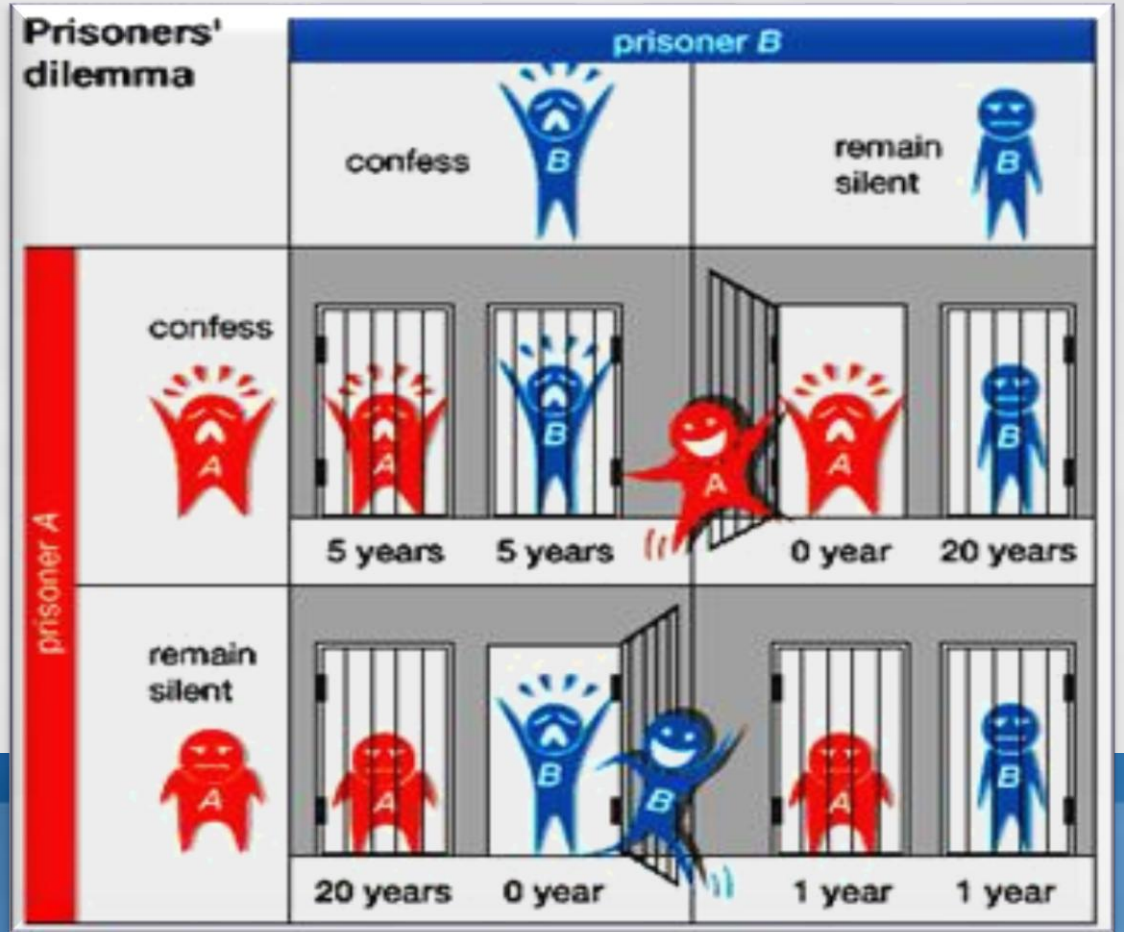
Game Outcomes

- Dominant Strategy -- This is the one outcome superior to any alternative strategy, regardless of what the opponent does. If each player has a dominant strategy, the game has a dominant strategy equilibrium.
- Nash Equilibrium -- Each player chooses the best strategy *given* the other's behavior, when there's no dominant strategy. (If you saw the movie *A Beautiful Mind*, this is based on John Nash's theories.)
- In the prisoner's dilemma game between Al and Ben, the dominant strategy makes each player worse off. The prisoners could both have been better off if they had adopted a cooperative strategy but, without the ability to communicate, they had no way of knowing that.

The Prisoner's Dilemma

The prisoners' dilemma illustrates a situation in which individuals arrive at a non-optimal solution, due to a lack of cooperation and trust.

A similar situation occurs with oligopolies. If firms within an oligopolistic industry cooperate with and trust each other, then they can theoretically maximize industry profits by setting a monopolistic price.



Cooperation between Competitors

- Cooperation
  - profit-maximising cartel (OPEC)
  - entry prevention pricing (limit pricing)
  - price leadership
  - avoidance of price competition: use of non-price competition
  - agree about standards
- But while cooperation is often beneficial to all parties, cheating may be better.

Cooperation between Competitors

- Cooperation is likely to be very unstable between competitors.
- The chances of successful co-operation depend on:
  - the magnitude of the potential gains
  - the temptation to cheat, the chances of detection and the chances of effective punishment
  - whether game is repeated (and so whether retaliation can occur)
  - whether trust has been established

The Payoff Matrix

The decision to initiate a price cut requires a risk assessment.

$$\text{Expected value} = \left[\begin{array}{c}\text{Probability of}\\ \text{rivals matching}\end{array} \cdot \begin{array}{c}\text{Size of loss}\\ \text{from pricecuts}\end{array}\right] + \left[\begin{array}{c}\text{Probability of}\\ \text{rivals not matching}\end{array} \cdot \begin{array}{c}\text{Gain from lone}\\ \text{pricecut}\end{array}\right]$$

Table: Oligopoly Payoff Matrix

	rivals' actions	
first firm's options	reduce price	don't reduce price
reduce price	small loss for everyone	huge gain for first firm; rivals lose
don't reduce price	huge loss for first firm; rivals gain	no change

Application: Excessive Advertising

- Assume Firms 1 and 2 competing for market share and profit, both hoping to expand sales by advertising.
- Both have refused to lose the market to the opponent's aggressive advertising instincts.
- Achieving a dominant strategy gives 80 units of profit to each.

PAYOFF MATRIX

		Firm 1	
		low expend	high expend
Firm 2	low expend	$\Pi 1=100$ ($\Pi 2=100$)	$\Pi 1=150$ ($\Pi 2=60$)
	high expend	$\Pi 1=60$ ($\Pi 2=150$)	$\Pi 1=80$ ($\Pi 2=80$)

Excessive Advertising: Outcomes

- Cooperation would have provided a better outcome, with both firms saving the advertising costs.
  - Note that with low expenditures being agreed on, each would earn 100 units of profit.
  - With the higher expenditures, each firm received only 80 units of profit.

Oligopoly vs. Competition

Firms in an oligopoly market may try to coordinate their behavior in a way that maximizes industry profits.

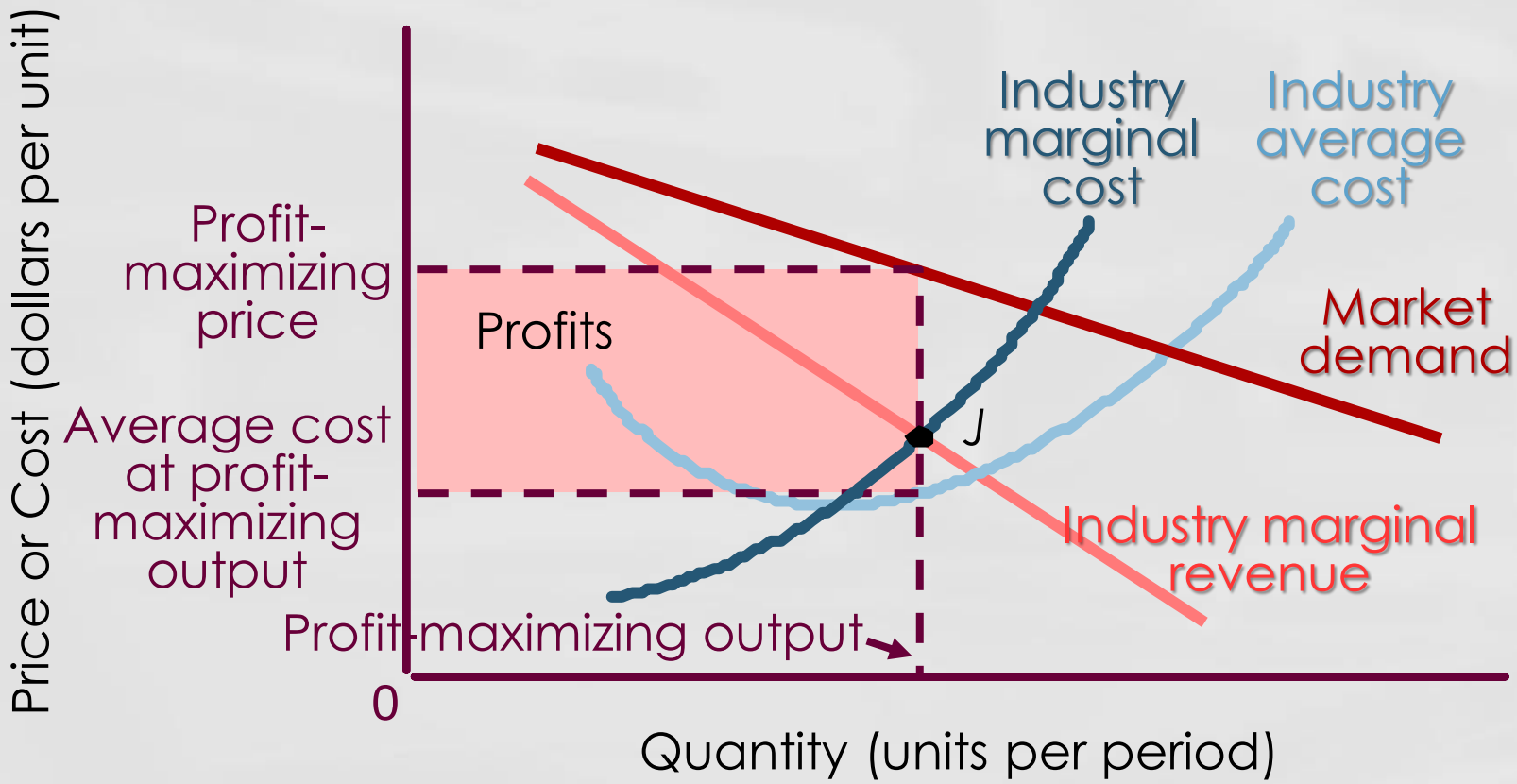
Price and Output

A firm in an oligopoly market will want to behave like a monopoly, choosing a rate of industry output that maximizes total industry profit.

Price and Output

To maximize industry profit, the firms in an oligopoly must agree on a monopoly price and agree to maintain it by limiting production and allocating market shares.

Chart: Maximizing Oligopoly Profits



Sticky Prices

- Prices in oligopoly industries tend to be stable.
- Like all producers, firms want to maximize profits by producing where MR = MC.
- sticky price -- The resistance of a price (or set of prices) to change, despite changes in the broad economy that suggest a different price is optimal. "Sticky" is a general economics term that can apply to any financial variable that is resistant to change. When applied to prices, it means that the prices charged for certain goods are reluctant to change despite changes in input cost or demand.

Sticky Prices

- The kinked demand curve is really a composite of two separate demand curves.
- There is a gap in an firm's marginal revenue (MR) curve.
  - marginal revenue – the change in total revenue that results from a one-unit increase in the quantity sold

Sticky Prices

As a result, modest shifts of the cost curve will have no impact on the production decision of a firm in an oligopoly market.

Chart: An Oligopolist's Marginal Revenue Curve

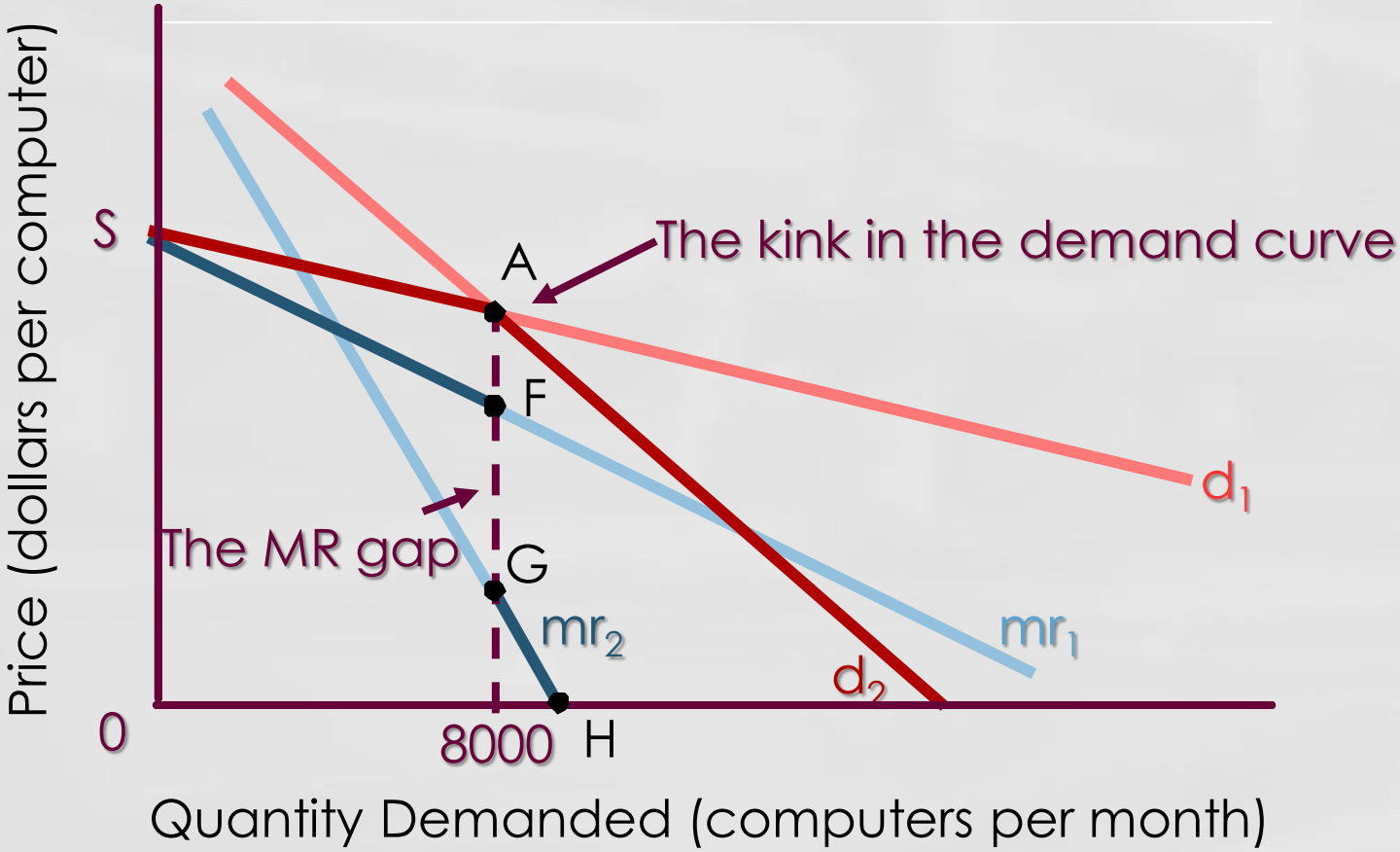
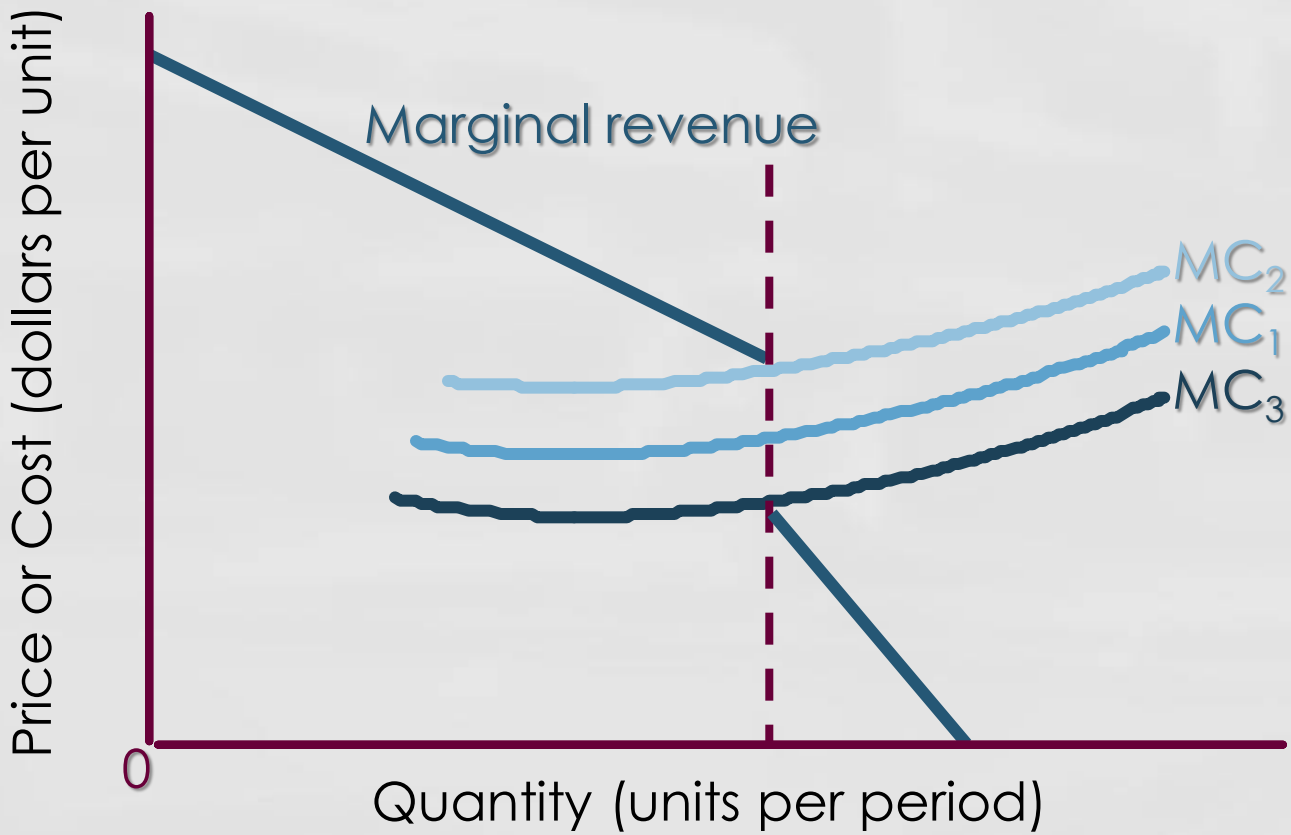


Chart: The Cost Cushion



Coordination Problems

- There is an inherent conflict in the joint and individual interests of oligopoly firms.
  - Each firm wants industry profits to be maximized.
  - Each firm wants to maximize it's own market share.

Coordination Problems

- To avoid self-destructive behavior, each firm must coordinate production decisions so that:
  - industry output and price are maintained at profit-maximizing levels.
  - each oligopolistic firm is content with its market share.

Price Fixing

- The most explicit form of coordination among oligopolists is called price fixing.
  - Price fixing is an explicit agreement among producers regarding the price(s) at which a good is to be sold.

Examples of Price Fixing

- electric generators - In 1961, General Electric and Westinghouse were convicted of fixing prices on electrical generators.
  - They were charged again in 1972 for continued price fixing.
- school milk – Between 1988 and 1991, the US Justice Department filed charges against 50 companies for fixing the price of milk sold to public schools in 16 states.

Examples of Price Fixing

- vitamins – Seven firms from four nations were accused of fixing global prices on bulk vitamins from 1990 - 1998.
- baby formula – Two makers of baby formula agreed to pay $5 million in 1992 to settle Florida charges that they had fixed prices on baby formula.

Examples of Price Fixing

- cola – The Coca-Cola Bottling Co. of North Carolina agreed to pay a fine and give consumers discount coupons to settle charges of conspiring to fix soft-drink prices from 1982 to 1985.
- music CDs – In 2001, the FTC charged AOL-Time Warner and Universal Music with fixing prices on the *Three Tenors* CD.

Examples of Price Fixing

- laser eye surgery – The FTC charged VISX and Summit Technology with price-fixing that raised the price of surgery by $500 per eye.
- memory chips – In 2004, prosecutors claimed the world's largest memory-chip (DRAM) makers (Samsung, Micron and Infineon) fixed prices in the $16 billion-a-year market.

continued in

Oligopoly Part IV